

ACCESSION #: 9910250002

NON-PUBLIC?: N

LICENSEE EVENT REPORT (LER)

FACILITY NAME: Brunswick Steam Electric Plant

(BSEP), Unit No. 2 PAGE: 1 OF 5

DOCKET NUMBER: 05000324

TITLE: Condenser Pressure Sensing Line Drain Activities Result

In Engineered Safety Feature and Reactor Protection

System Actuation

EVENT DATE: 09/20/1999 LER #: 1999-008-00 REPORT DATE: 10/20/1999

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 2 POWER LEVEL: 004

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:

50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

NAME: Charles R. Elberfeld TELEPHONE: (910) 457-2136

Senior Analyst - Regulatory Affairs

COMPONENT FAILURE DESCRIPTION:

CAUSE: SYSTEM: COMPONENT: MANUFACTURER:

REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On September 20, 1999, at approximately 0009 hours, operational activities to drain the

condenser pressure transmitter sensing lines resulted in a Group 1 Primary Containment Isolation system actuation. The subsequent activities to recover from the isolation and continue startup resulted in an unexpected reactor power increase and the insertion of a manual Reactor Protection system (RPS) actuation at 0105 hours. At the time of the event, Unit No. 2 was in Mode 2, operating at approximately four percent of rated power.

The cause of the event is attributed to the inadequate implementation of corrective action to a previously identified condition (i.e., condensate buildup in the transmitter sensing lines). The inadequate implementation involved proceduralizing a work-around for the condition. Contributing factors to the event were inadequate procedural adherence and ineffective communication regarding crew interactions on the part of the Senior Reactor Operator (SRO) in charge of the startup.

Corrective actions include a procedure revision to ensure adequate steps were included. An engineering review will be performed to better understand the work-around. An evaluation will also be performed to identify other "institutionalized" work-arounds, applying the lessons learned from this event. The SRO involved with this event has been coached regarding procedural adherence and the need for ensuring adequate communication skills regarding crew interactions.

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Energy Industry Identification System (EIIS) codes are identified in the text as [XX].

INTRODUCTION

On September 20, 1999, at approximately 0009 hours, operational activities to drain condenser pressure transmitter [PT] sensing lines [TBG] with the low condenser vacuum bypass switches in their "NORMAL" positions resulted in a Group 1 Primary Containment Isolation system [JM] actuation. The subsequent activities to recover from the isolation and continue startup resulted in an unexpected reactor power increase and culminated in the insertion of a manual Reactor Protection system [JC] (RPS) actuation at 0105 hours. At the time of the event, Unit No. 2 was in Mode 2 (i.e.,

Startup), operating at approximately four percent of rated power. This event is being reported in accordance with 10 CFR 50.73(a)(2)(iv), as a condition that resulted in the automatic actuation of an Engineered Safety Feature (ESF) and the manual actuation of the RPS.

EVENT DESCRIPTION

On September 19, 1999, post-Hurricane Floyd reactor startup activities were in progress in accordance with General Plant Operating Procedure (0GP-02), "Approach to Criticality and Pressurization of the Reactor." With the plant in Mode 2, the reactor at four percent of rated power, and the reactor pressure vessel pressure at approximately 450 psig, activities were commenced in accordance with 0GP-02 to drain potentially accumulated condensate from the condenser pressure transmitter sensing lines. These transmitters supply signals to instrumentation that provides input to the Group 1 Primary Containment Isolation system logic which actuates when the transmitters sense a low condenser vacuum condition. Low condenser vacuum bypass switches override the instrumentation input to the logic when the switches are placed in the "BYPASS" position. During transmitter sensing line drain activities, which apply to Unit No. 2 only, 0GP-02 requires the switches to be in the "BYPASS" position.

However, the Unit No. 2 Senior Reactor Operator (SRO) placed the bypass switches in the "NORMAL" position, prior to the transmitter sensing line drain activities taking place in the field. As a result, the bypass switches were in the incorrect position when the transmitter sensing line

drain activities commenced. This resulted in a Group 1 Primary Containment Isolation system actuation on September 20, 1999, at 0009 hours. The Main Steamline Isolation valves (MSIVs), Steamline Drain valves, and Reactor Recirculation Sample valves closed per design. Reactor pressure vessel pressure increased to a peak of approximately 1030 psig and then stabilized at approximately 950 psig as the reactor operator reduced reactor power by inserting control rods. Reactor water level increased resulting in a trip of the turbine driven feedwater [SJ] pump [P]. Reactor Coolant system (RCS) temperature increased at a maximum rate of approximately 120 degrees Fahrenheit (F) per hour, which exceeded the Technical Specification (TS) Limiting Condition for Operation (LCO) 3.4.9 limit of 100 degrees F per hour.

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At 0020 hours, activities commenced to equalize steam pressure around the MSIVs in preparation for their opening. By 0058 hours, the MSIVs were opened and activities were underway to place a turbine driven feedwater pump into service.

On September 20, 1999, at 0104 hours, turbine driven feedwater pump "A" was placed into service. Placing turbine driven feedwater pump "A" into service resulted in relatively cooler water being added to the reactor pressure vessel in a short amount of time due to voiding in the feedwater lines. At 0105 hours, the addition of cooler water caused reactor power to increase and a RPS half-scam signal was initiated from the Intermediate

Range Monitor (IRM) neutron monitoring instrumentation [IG]. The reactor operator inserted a manual scram signal in accordance with the SRO's instruction. The plant entered Emergency Operating Procedure (EOP-01-RSP), "Reactor Scram Procedure," in response to the RPS actuation, and was placed in Mode 3 (i.e., Hot Shutdown) in accordance with plant procedures. At 0359 hours, notification of the ESF and RPS actuations was made to the NRC (Event Number 36201) in accordance with 10 CFR 50.72(b)(2)(11).

EVENT CAUSE

The cause of the event is attributed to the inadequate implementation of corrective action to a previously identified condition (i.e., condensate buildup in the transmitter sensing lines). The inadequate implementation involved proceduralizing a work-around for the condition. The procedure revision, originating in October 1988, made in response to this condition, did not provide an adequate barrier to prevent challenging the plant. The procedural guidance requiring the personnel responsible for performing the transmitter sensing line drain evolution to ensure that the low condenser vacuum bypass switches were in the "BYPASS" position was contained in a "Note," rather than a specific procedure step. The SRO overlooked this note when he placed the low condenser bypass switches in the "NORMAL" position prior to completion of the transmitter sensing line drain activities. The inadequate implementation was further evidenced by the lack of clear documentation to explain the nature or extent of the problem (i.e., why the condensate builds up in the lines and how the condensate in

the lines affects the instrumentation).

Contributing factors to the event were inadequate procedural adherence and ineffective communications regarding crew interactions on the part of the SRO in charge of the Unit No. 2 startup. Additionally, as part of the event investigation, weaknesses were identified in the implementation of expectations regarding plant staffing and procedural adherence as additional barriers to enhance human performance.

CORRECTIVE ACTIONS

The RCS heatup/cooldown rate was restored to within limits in accordance with LCO 3.4.9 REQUIRED ACTION A.1. In accordance with LCO 3.4.9 REQUIRED ACTION A.2, the RCS was determined to be acceptable for continued operation. The event was reviewed by plant management, the plant was placed in Mode 2 on September 20, 1999, at 1515 hours, and startup commenced in accordance with plant procedures.

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Procedure OGP-02 was revised to include discrete steps to ensure that the Unit No. 2 low condenser vacuum bypass switches are in the "BYPASS" position prior to draining the instrument lines.

The SRO involved with this event has been coached regarding procedural adherence and the need for ensuring adequate communication skills regarding crew interactions.

By May 1, 2001, an engineering review will be performed to evaluate the necessity for draining the condenser pressure transmitter sensing lines.

By June 1, 2000, an evaluation will be performed to identify other "institutionalized" work-arounds, and the lessons learned from this event will be applied.

Other enhancements/corrective actions planned as a result of this event include review of the event and opportunities for improvement with Operations personnel, exploring potential engineering-related enhancements to the Condensate and Feedwater systems, and performance of a training needs analysis with respect to the Condensate and Feedwater systems.

SAFETY ASSESSMENT

The safety significance of this event is considered to be minimal.

Operation of the plant was within design limits and the affected systems responded as designed. The Group 1 isolation and reactor scram are . anticipated operational occurrences bounded by existing safety analyses.

The evaluation of the effects of the reactor coolant heatup rate exceeding the TS LCO limit concluded that the RCS was acceptable for continued operation. In addition, the Emergency Core Cooling systems were operable during the event and could have responded as designed, if needed.

PREVIOUS SIMILAR EVENTS

LER 1-99-002 documented an event on Unit No. 1 in which a manual reactor trip was inserted with reactor power at approximately 25 percent. The trip was inserted due to single loop operation of the reactor recirculation system resulting in reactor vessel bottom head stratification and operation near the vessel pressure and temperature limits. The causes of the event

were attributed to (1) the failure to adequately evaluate the impact of a recently installed thermal hydraulic instability modification on plant operations and (2) the lack of awareness by control room personnel of the effects of longer than anticipated single loop operations at minimum flow conditions and the impact of such conditions on reactor bottom head stratification. Corrective actions included establishing the necessary procedural controls and training to prevent recurrence.

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LER 2-98-003 documented an event which resulted in the automatic closure of the inboard and outboard MSIVs. During a Unit No. 2 plant startup, two main turbine bypass valves (BPVs) fully opened and a third BPV partially opened, causing main steam flow to exceed 40 percent with the reactor mode switch not in the "RUN" position. By design, this condition resulted in the automatic closure of the inboard and outboard MSIVs. The cause of the MSIV isolations was attributed to procedure inadequacy in that unit startup and shutdown procedures did not provide the controls necessary for ensuring that the BPV jack was in the "CLOSED" position prior to commencing reactor startup. Corrective actions included review of the lessons learned from this occurrence with Operations personnel and revisions to the affected operating procedures.

The corrective actions associated with the events documented by LERs 1-99-002 and 2-98-003 could not reasonably be expected to have prevented the event documented by LER 2-99-008.

COMMITMENTS

Those actions committed to by Carolina Power & Light (CP&L) Company in this document are identified below. Any other actions discussed in this submittal represent intended or planned actions by CP&L. They are described for the NRC's information and are not regulatory commitments.

Please notify the Manager - Regulatory Affairs at BSEP of any questions regarding this document or any associated regulatory commitments.

1. By May 1, 2001, an engineering review will be performed to evaluate the necessity for draining the condenser pressure transmitter sensing lines.

2. By June 1, 2000, an evaluation will be performed to identify other "Institutionalized" work-arounds, and the lessons learned from this event will be applied.

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CP&L

Carolina Power & Light Company

P.O. Box 10429

Southport, NC 28461-0429

October 20, 1999 10 CFR 50.73

SERIAL: BSEP 99-0162

U. S. Nuclear Regulatory Commission

ATTN: Document Control Desk

Washington, DC 20555-0001

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NO. 2

DOCKET NO. 50-3241 LICENSE NO. DPR-62

LICENSEE EVENT REPORT 2-99-008

Gentlemen:

In accordance with the Code of Federal Regulations, Title 10, Part 50.73,

Carolina Power & Light (CP&L) Company submits the enclosed Licensee Event

Report. This report fulfills the requirement for a written report within

thirty (30) days of a reportable occurrence.

Please refer any questions regarding this submittal to Mr. Keith R. Jury,

Manager - Regulatory Affairs, at (910) 457-2783.

Sincerely,

C. J. Gannon

Plant General Manager

Brunswick Steam Electric Plant

CRE/cre

Enclosure: Licensee Event Report

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cc (with enclosure):

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